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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/641,815	08/18/2000	Joseph M. DeSimone	5051-441	7597

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EXAMINER
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PREISCH, NADINE G

ART UNIT	PAPER NUMBER
1764	12

DATE MAILED: 04/09/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No. 71 12

09/641,815

Applicant(s)

DESIMONE ET AL.

Examiner

Nadine Preisch

Art Unit

1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM  
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1) ☒ Responsive to communication(s) filed on 04 January 2002.

2a) ☐ This action is FINAL.

2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

4) ☒ Claim(s) 1-20, 47 and 48 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.

6) ☐ Claim(s) 1-20, 47 and 48 is/are rejected.

7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.

8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some \* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5 and 7.

4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other:

## DETAILED ACTION

### *Election/Restrictions*

Claims 21-46 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Election was made **without** traverse in Paper No. 10.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 9 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 9 and 11 contain the phrase "derived from". The phrase renders the claim indefinite because it is unclear how the enzymes and/or polymers are derived. The final composition of the "derived" enzyme is not defined.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 2, 4-20 and 47-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bitler et al.(6,255,367) in view of "Supercritical Fluids in Heterogeneous Catalysis" by Baiker.

Applicants are claiming a method for carrying out a reaction in carbon dioxide. The claimed process involves contacting a fluid mixture with a catalyst bound to a polymer in order to form a reaction product.

The reference of Bitler et al.(6,255,367) discloses a composition suitable for accomplishing hydrogenation. See column 13, lines 57-60. The reference teaches that the composition contains a polymer and a catalytically active ingredient. Suitable polymers include fluorinated polymers derived from acrylates or methacrylates (fluoracrylates) and styrene. See column 10, lines 5-10 & 51-56 and column 11, lines 66-67. Bitler et al.(6,255,367) teaches that the invention can make use of "any" modifying agent in which a catalytically active ingredient is bonded or associated with a temperature sensitive polymeric ingredient. See column 13, lines 23-29. The reference teaches that chemically active ingredients and modifying agents include enzymes, rhodium and vanadium. The reference also teaches that such ingredients are attached by ligands. See column 13, lines 1-10. The reference also discloses the presence of a phosphate. See column 19, line 55.

The reference of Bitler et al.(6,255,367) discloses a composition with components corresponding to those defined in applicants claims which can be used for hydrogenation.

A difference is noted between the teachings of Bitler et al.(6,255,367) and applicants' claimed invention. The reference is silent about employing the disclosed compositions in the presence of carbon dioxide.

The reference of Baiker is cited to illustrate that it is known that accomplishing a hydrogenation reaction in the presence of supercritical carbon dioxide will desirably increase the solubility of hydrogen. See page 466, lines 18-63. Note: The disclosure of supercritical carbon dioxide is considered to encompass gaseous carbon dioxide because supercritical carbon dioxide is a "gas" at a temperature exceeding the critical temperature and pressure.

Since the reference of Bitler et al.(6,255,367) does not limit the hydrogenation conditions used in conjunction with the disclosed composition, it would have been obvious to one of ordinary skill in the art at the time the invention was made to desiring to accomplish a hydrogenation reaction to employ supercritical carbon dioxide because the reference of Baiker illustrates that it is known that supercritical carbon dioxide functions to desirably increase the solubility of the hydrogen. Motivation to employ supercritical carbon dioxide during hydrogenation is the desire for greater hydrogen solubility. Applicants have not shown anything unexpected by modifying the reference of Bitler et al.(6,255,367) with the known use of carbon dioxide to improve hydrogenation reactions.

*Claim Rejections - 35 USC § 103*

Claims 1, 2, 47, and 48 rejected under 35 U.S.C. 103(a) as being unpatentable over DeSimone et al.(6,211,422) in view of Bitler et al.(6,255,367).

Applicants are claiming a method for carrying out a reaction in carbon dioxide. The claimed process involves contacting a fluid mixture with a catalyst bound to a polymer in order to form a reaction product.

The reference of DeSimone et al.(6,211,422) discloses a method of enzyme catalysis in the presence of carbon dioxide (liquid or supercritical) to produce a desired product. See abstract, lines 1-2 and column 6, lines 34-36. The reference teaches that the enzymatic catalyst is crosslinked and deposited on a support. See column 1, lines 44-46 and column 3, lines 15-25. Suitable enzymatic catalysts include alcohol dehydrogenase, alcohol oxidase, aldose, etc. See column 3, lines 1-20.

The reference of DeSimone et al.(6,211,422) succeeds at disclosing a process involving process conditions and the use of a catalyst corresponding to that claimed by applicants.

It is noted that the reference is silent about the type of solid support used for the enzymatic catalyst.

The reference of Bitler et al.(6,255,367) teaches that enzymatic components can be bound to a polymeric support. See column 13, lines 23-29. See the remainder of Bitler teachings above.

Since the teachings of DeSimone et al.(6,211,422) do not limit the type of solid support, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select the a polymer support because Bitler et al.(6,255,367) discloses that polymers are

suitable supports for enzymatic catalysts. In the absence of unexpected results, any support known to be effective for enzymatic reactions (including polymeric supports) would be obvious in view of the teachings of DeSimone et al.(6,211,422).

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6, 20, 47 and 48 are rejected under 35 U.S.C. 102(b) as being anticipated by Tacke et al.(5,734,070).

Applicants are claiming a method for carrying out a reaction in carbon dioxide. The claimed process involves contacting a fluid mixture with a catalyst bound to a polymer in order to form a reaction product.

The reference of Tacke et al.(5,734,070) discloses a hydrogenation process involving the use of a polymer supported Pd, Rh, Pt, or Ru catalyst. See column 3, lines 23-28 and column 4, lines 45-55. The process is accomplished in the presence of supercritical carbon dioxide. See column 5, lines 16-22.

The reference of Tacke et al.(5,734,070) discloses a hydrogenation process involving the use of a composition with components corresponding to those claimed by applicants in the presence of carbon dioxide. Note: The disclosure of supercritical carbon dioxide is considered to

encompass gaseous carbon dioxide because supercritical carbon dioxide is a "gas" at a temperature exceeding the critical temperature and pressure.

Applicants' process is anticipated by the reference of Tacke et al.(5,734,070) because it discloses essentially the same process steps/compositions claimed by applicants.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nadine Preisch whose telephone number is 703-305-2667. The examiner can normally be reached on Monday through Thursday from 7:30 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marian Knode can be reached on 703-308-4311. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-0661.

N.P.

April 6, 2002

**NADINE PREISCH**  
**ART UNIT 1764**

